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10-14-03  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of

Hong Zhang et al.

Serial No.: 10/056,438

Filed: January 23, 2002



FOR: COMPUTER-AIDED IMAGE  
ANALYSIS

Group  
Art Unit: 2122

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.97 AND 1.98**

Assistant Commissioner for Patents  
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Attention: Examiner

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**Technology Center 2100**

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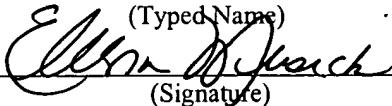
Applicant submits herewith references of which they are aware, they believe may be material to patentability of the invention disclosed and claimed in the above-cited application and with respect to which there may be a duty to disclose in accordance with 37 C.F.R. § 1.56.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on:

March 25, 2002

Eleanor M. Musick

(Typed Name)

  
(Signature)

March 25, 2002

(Date of Signature)

Applicants submit herewith copies of the references which are set forth on the attached Form PT/SB/08A. As all relevant parts of the references are in the English language, no explanation of the references is provided herein.

This Information Disclosure Statement is submitted within three (3) months of the filing date of the above-cited application or of the date of entry into the national phase of the application or prior to the mailing date of a first Office Action thereon, whichever has occurred last, such that no fee is required.

Further, while the references provided in this Information Disclosure Statement may be material to patentability pursuant to 37 C.F.R. § 1.56, it is not intended to constitute an admission that any reference referred to herein is prior art for this invention unless specially designated as such.

Also, in accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 C.F.R. § 1.56(a) exists.

Respectfully submitted,

Dated: March 25, 2002

By:   
Eleanor M. Musick  
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Docket No. 02331-0302 (42286/267666)

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Substitute for form 1449A/PTO		Complete if Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>		Application Number	10/056,438
		Filing Date	January 23, 2002
		First Named Inventor	Hong Zhang et al.
		Group Art Unit	Unknown
		Examiner Name	Unknown
		Attorney Docket Number	02331-0302 (42286/267666)

Examiner Signature		Date Considered	
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<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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SEARCHED	INDEXED	APR 04 2002	SERIALIZED		
Sheets attached		2	of 8		
				Attorney Docket Number	02331-0302 (42286/267666)

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	B1	ADEL, M. et al. Quality Control of Mammographic Images: Automated Detection of Microcalcifications in Phantom Images, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 34.	
	B2	BLOT, L. and ZWIGGELAAR, R. Extracting Background Texture in Mammographic Images: A Co-occurrence Matrices Based Approach, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 36	
	B3	BOTTEMA, M.J. and SLAVOTINEK, J.P. Detection of Microcalcifications Associated with Cancer, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 37.	
	B4	BRUYNOGHE, M. High Resolution Granulometric Analysis for Early Detection of Small Microcalcification Clusters in X-ray Mammograms, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 38.	
	B5	CAMPANINI, R. et al. Automatic Detection of Clustered Microcalcifications Using a Combined Method with a Support Vector Machine (SVM) Classifier, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 39.	
	B6	FIELDS, S. et al. Analysis of Computer Extracted Features Related to Size of Micro-Calculations: Correlation with Pathologic Diagnosis, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 41.	
	B7	FUKUOKA, D. et al. Automated Detection and Classification of Masses on Breast Ultrasonograms and its 3D Imaging Technique, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 42.	
	B8	GIGER, M.L. et al. Computerized Classification of Lesions on Digital Mammography, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 43.	
	B9	HAGIHARA, Y. et al. Accurate Detection of Microcalcifications on Mammograms by Improvement of Morphological Processing, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 44.	
	B10	HARA, T. et al. Automated Classification Method of Mammographic Microcalcifications by Using Artificial Neural Network and ACR BI-RADS Criteria of Microcalcification Distribution, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 45.	
	B11	HATANAKA, Y. et al. An Automatic Detection Algorithm for Masses with a Partial Loss of Region on Mammograms, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 46.	

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	B12	HOLMES, A.S. and TAYLOR, D.J. Computer-Aided Diagnosis: An Improved Metric Space for Pixel Signatures, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 49.		
	B13	KAUFMANN, G.H. et al. Automated Detection and Classification of Clustered Microcalcifications Using Morphological Filtering and Statistical Techniques, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 53.		
	B14	PETRICK, N. et al. Preclinical Evaluation of a CAD Algorithm for Early Detection of Breast Cancer, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 63.		
	B15	SAHINER, B. et al. Active Contour Models for Segmentation and Characterization of Mammographic Masses, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 68.		
	B16	JIANG, Y. et al. Computer-Aided Diagnosis of Malignant and Benign Microcalcifications in Small-Field Digital Mammograms, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 51.		
	B17	LEE, G.N., and BOTTEMA, M.J. Classification of Masses in Screening Mammograms as Benign or Malignant, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 54.		
	B18	LU, S. and BOTTEMA, M.J. Classifying Lobular and DCIS Microcalcifications, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 56.		
	B19	RACZ, J. et al. Computer Aided Diagnosis Based on Analysis of Microcalcifications, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 67.		
	B20	SENDRA, F. et al. Methodology of Interactive Segmentation and Feature Analysis of Masses in Digitized Mammograms, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 70.		
	B21	VALVERDE, F.L. et al. Elimination of Calcified False Positives in Detection of Microcalcifications in Mammograms Using Hough Transform, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 72.		
	B22	VELDKAMP, W.J.H., KARSSEMEIJER, N., and HENDRIKS, J.H.C.L. Fully Automated Classification of Microcalcification Cases Referred from a Nation-Wide Screening Program, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 73.		

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	B23	VELTHUIZEN, R.P. Computer Description of Mammographic Masses, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 74.		
	B24	WOO, J.H. et al. Evaluation of the Architecture Similarity Between Left and Right Breast, IWDM 2000, Fifth International Workshop on Digital Mammography, June 2000, p. 75.		
	B25	MUDIGONDA, N.R., RANGAYYAN, R.M., and DESAUTELS, J.E.L. Segmentation and classification of mammographic masses, <i>Medical Imaging 2000: Image Processing</i> , Proc. SPIE Vol. 3979, February 2000, pp 55 - 67.		
	B26	VELTHUIZEN, R. and GANGADHARAN, D. Mammographic mass classification: initial results, <i>Medical Imaging 2000: Image Processing</i> , Proc. SPIE Vol. 3979 (2000), pp 68 – 76.		
	B27	HUO, Z. and GIGER, M.L. Incorporation of clinical data into a computerized method for the assessment of mammographic breast lesions, <i>Medical Imaging 2000: Image Processing</i> , Proc. SPIE Vol. 3979 (2000), pp 151 – 152.		
	B28	LO, J.Y., LAND, W.H., and MORRISON, C.T.. Evolutionary programming technique for reducing complexity of artificial neural networks for breast cancer diagnosis, <i>Medical Imaging 2000: Image Processing</i> , Proc. SPIE Vol. 3979 (2000), pp 153 – 158.		
	B29	ZHOU, C. et al. Computerized image analysis: Estimation of breast density on mammograms, <i>medical imaging 2000: Image Processing</i> , Proc SPIE Vol. 3979 (2000), pp 1615 – 1624.		
	B30	SIVARAMAKRISHNA, R. et al. Comparing the Performance of Mammographic Enhancement Algorithms, <i>American Journal of Roentgenology</i> (2000), Vol 175, pp 45 – 51.		
	B31	FLOYD, C.E., JR, LO, J.Y., and TOURASSI, G.D. Case-Based Reasoning Computer Algorithm that Uses Mammographic Findings for Breast Biopsy Decisions, <i>American Journal of Roentgenology</i> (2000), Vol. 175, pp. 1347 – 1352.		
	B32	GOOD, W.F. et al. Detection of Masses and Clustered Microcalcifications on Data Compressed Mammograms, <i>American Journal of Roentgenology</i> (2000), Vol. 175, pp 1537 – 1576.		
	B33	LEAVERS, V.F. Use of the Two-dimensional Radon Transform to Generate a Taxonomy of Shape for the Characterization of Abrasive Powder Particles, <i>IEEE Transactions on Pattern Analysis and Machine Intelligence</i> , Vol. 22, No. 12, December 2000, pp 1411 – 1423.		

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Examiner Name	Unknown

**INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

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	B34	ABDOLMALEKI, P. et al. Neural network analysis of breast cancer from MRI findings, <i>Radiat. Med.</i> , Sept. – October 1997, Vol. 15 No. 5, pp 283 – 293.,
	B35	ARANA, E. et al. Calvarial eosinophilic granuloma: diagnostic models and image feature selection with a neural network, <i>Acad. Radiol.</i> June 1998, Vol. 5, No. 6, pp. 427 – 434.
	B36	BARRA, V. and BOIRE, J.Y. Tissue segmentation on MR images of the brain by possibilistic clustering on a 3D wavelet representation, <i>J. Magn. Reson. Imaging</i> , March 2000, Vol. 11, No. 3, pp 267 – 278.
	B37	CHAN, H.P. et al. Computer-aided detection of mammographic microcalcifications: pattern recognition with an artificial neural network, <i>Med. Phys.</i> , October 1995, Vol. 22, No. 10, pp. 1555-1567.
	B38	CHAN, H.P. et al. Computerized classification of malignant and benign microcalcifications on mammograms: texture analysis using an artificial neural network, <i>Phys. Med. Biol.</i> , March 1997, Vol. 42, No. 3, pp. 549 – 567.
	B39	CHAN, H.P. et al. Computerized analysis of mammographic microcalcifications in morphological and texture feature spaces, <i>Med. Phys.</i> , October 1998, Vol. 25, No. 10, pp 2007 – 2019.
	B40	CHANG, Y.H. et al., Identification of clustered microcalcifications on digitized mammograms using morphology and topography-based computer-aided detection schemes. A preliminary experiment, <i>Invest. Radiol.</i> October 1998, Vol. 33, No. 10, pp 746 – 751.
	B41	DAWSON, A.E., AUSTIN, R.E., JR., and WEINBERG, D.S. Nuclear grading of breast carcinoma by image analysis. Classification by multivariate and neural network analysis, <i>Am. J. Clin. Pathol.</i> , April 1991, Vol. 95, 4 Suppl. 1, S29 – 37.
	B42	DECAESTECKER, C. et al. Improving morphology-based malignancy grading schemes in astrocytic tumors by means of computer-assisted techniques, <i>Brain Pathol.</i> , January 1998, Vol. 8, No. 1, pp 29 – 38.
	B43	FOGEL, D.B. et al. Linear and neural models for classifying breast masses, <i>IEEE Trans. Med. Imaging</i> , June 1998, Vol. 17, No. 3, pp 485 – 488.
	B44	FREED, K.S. et al., Predictive model for the diagnosis of intraabdominal abscess, <i>Acad. Radiol.</i> , July 1998, Vol. 5, No. 7, pp 473 – 479.

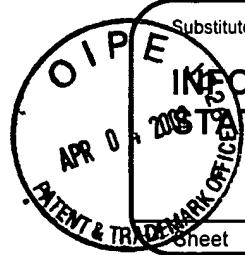
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Sheet	6	of	8		

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	B44	GAVRIELIDES, M.A. et al. Segmentation of suspicious clustered microcalcifications in mammograms, <i>Med. Phys.</i> , January 2000, Vol. 27, No. 1, pp 13 – 22.	
	B45	GOLAY, X. et al. A new correlation-based fuzzy logic clustering algorithm for fMRI, <i>Magn. Reson. Med.</i> , August 1998, Vol. 40, No. 2, pp 249 – 260.	
	B46	HEATHFIELD, H.A., WINSTANLEY, G. and KIRKHAM, N. Computer-assisted breast cancer grading, <i>J. Biomed. Eng.</i> , October 1988, Vol. 10, No. 5, pp 379 – 386.	
	B47	HEITMANN, K.R. et al. Automated detection of spleen volume by spiral CT scans using neural networks and "fuzzy logic", <i>Röfo Fortschr. Geb. Rontgenstr. Neuen. Bildgeb. Verfahr.</i> , February 2000, Vol. 172, No. 2, pp 139 – 146.	
	B48	HENSCHKE, C.I., et al. Neural networks for the analysis of small pulmonary nodules, <i>Clin. Imaging</i> , November-December 1997, Vol. 21, No. 6, pp 390 – 399.	APR 12 2002
	B49	ISHIDA, T. et al. Application of artificial neural networks for quantitative analysis of image data in chest radiographs for detection of interstitial lung disease, <i>J. Digit Imaging</i> , November 1998, Vol. 11, No. 4, pp 182 – 192.	Technology Center 2100
	B50	JIANG, Y. et al. Malignant and benign clustered microcalcifications: automated feature analysis and classification, <i>Radiology</i> , March 1996, Vol. 198, No. 3, pp 671 – 678.	
	B51	JIANG, Y. et al. Improving breast cancer diagnosis with computer-aided diagnosis, <i>Acad. Radiol.</i> January 1999, Vol. 6, No. 1, pp 22 – 33.	
	B52	KALMAN, B.L. et al. Prescreening entire mammograms for masses with artificial neural networks: preliminary results, <i>Acad. Radiol.</i> , June 1997, Vol. 4, No. 6, pp 405 – 414.	
	B53	KIM, J.K. and PARK, H.W. Statistical textural features for detection of microcalcifications in digitized mammograms, <i>IEEE Trans. Med. Imaging</i> , March 1999, Vol. 18, No. 3, pp 231 – 238.	
	B54	KOPANS, D.B. Double reading, <i>Radiol. Clin. North Am.</i> , July 2000, Vol. 38, No. 4, pp 719 – 724.	

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INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

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Sheet

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	B55	KOVALERCHUK, B. et al. Fuzzy logic in computer-aided breast cancer diagnosis: analysis of lobulation, <i>Artif. Intell. Med.</i> , September 1997, Vol. 11, No. 1, pp 75 – 85.	
	B56	LAU, T.K. and BISCHOF, W.F. automated detection of breast tumors using the asymmetry approach, <i>Comput. Biomed. Res.</i> , June 1991, Vol. 24, No. 3, pp 273 – 295.	
	B57	MADSEN, M.T. et al. Pulmonary CT image classification with evolutionary programming, <i>Acad. Radiol.</i> , December 1999, Vol. 6, No. 12, pp 736 – 741.	
	B58	NGAN, S.C. and HU, X. Analysis of functional magnetic resonance imaging data using self-organizing mapping with spatial connectivity, <i>Magn. Reson. Med.</i> , May 1999, Vol. 41, No. 5, pp 939 – 946.	
	B59	O'LEARY, T.J., MIKEL, U.V., and BECKER, R.L. Computer-assisted image interpretation: use of a neural network to differentiate tubular carcinoma from sclerosing adenosis, <i>Mod. Pathol.</i> , July 1992, Vol. 5, No. 4, Pp 402 – 405.	
	B60	PANTAZOPOULOS, D. et al. Back propagation neural network in the discrimination of benign from malignant lower urinary tract lesions, <i>J. Urol.</i> , May 1998, Vol. 159, No. 5, pp 1619 – 1623.	
	B61	PATRICK, E.A. et al. Expert learning system network for diagnosis of breast calcifications, <i>Invest. Radiol.</i> , June 1991, Vol. 26, No. 6, pp 534 – 539.	
	B62	PAVLOPOULOS, S. et al. Fuzzy neural network-based texture analysis of ultrasonic images, <i>IEEE Eng. Med. Biol. Mag.</i> , January-February 2000, Vol. 19, No. 1, pp 39 – 47.	
	B63	QIAN, W. et al. Digital mammography: comparison of adaptive and nonadaptive CAD methods for mass detection, <i>Acad. Radiol.</i> , August 1999, Vol. 6, No. 8, pp 471 – 480.	
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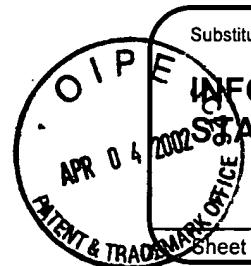
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				Group Art Unit	Unknown
				Examiner Name	Unknown
				Attorney Docket Number	02331-0302 (42286/267666)
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